

**WEISER HEAD START (PWS 3440010)
SOURCE WATER ASSESSMENT FINAL REPORT**

May 8, 2001



**State of Idaho
Department of Environmental Quality**

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for Weiser Head Start*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The Weiser Head Start drinking water system consists of one well. The inorganic contaminants fluoride and cyanide have been detected in the drinking water, but at levels below the Maximum Contaminant Level. The delineation capture zone crosses a nitrate priority area and a priority area for the synthetic organic contaminant atrazine. With the new drinking water Maximum Contaminant Level for arsenic (0.010 mg/l) in the process of being established, Weiser Head Start may have to treat their water for arsenic. In terms of total susceptibility, the Weiser Head Start well water rated high for inorganic contaminants, and moderate for volatile organic contaminants, synthetic organic contaminants, and microbial contaminants due to agricultural land uses, the nearby location of Highway 95 and the Union Pacific Railroad, and the lack of well log information.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For Weiser Head Start, source water protection activities should focus maintaining the standards for wellhead and sanitary seal protection. Since arsenic contamination may exceed the new drinking water standards, Weiser Head Start should investigate various systems like ion exchange, reverse osmosis, or activated alumina that could be used to treat this problem. Any spills from Highway 95 or the Union Pacific Railroad should be carefully monitored. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented. Most of the designated areas are outside the direct jurisdiction of the Weiser Head Start. Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community with a fully-developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact the Boise Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR WEISER HEAD START, WEISER, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings, used to develop this assessment, is also attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of this assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Weiser Head Start well is a non-community non-transient well serving approximately 50 people with one connection, located in Washington County, south of Weiser, east of the intersection of Highway 95 and Sunnyside Road (Figure 1).

Though there are no current water quality issues facing Weiser Head Start, there is the possibility of arsenic contamination, nitrate contamination, and possible synthetic organic chemical (SOC) contamination from the pesticide atrazine and the problems associated with managing this contamination.

Defining the Zones of Contribution – Delineation

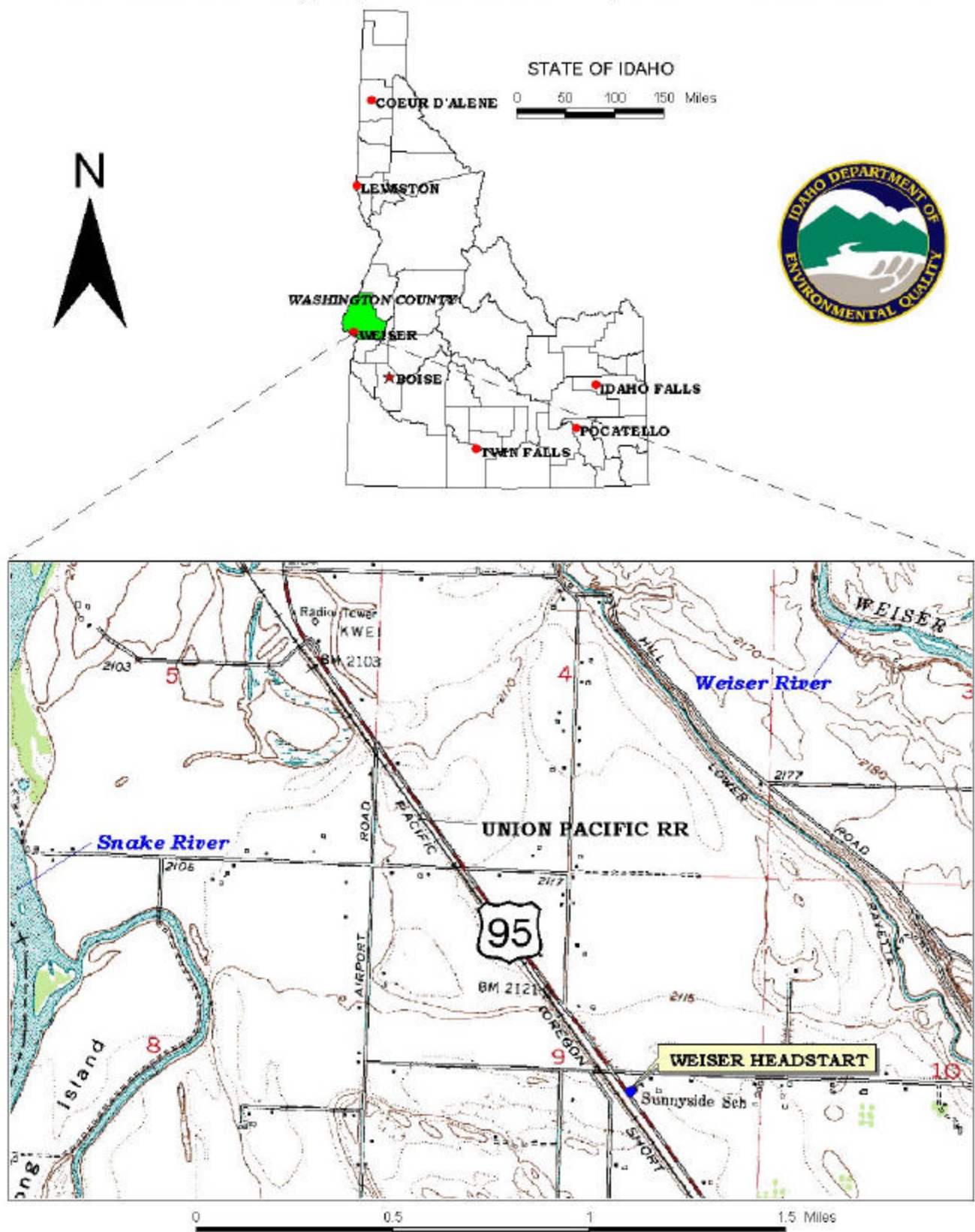
The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) time-of-travel (TOT) for water associated with the Scott Creek – Mann Creek aquifer in the vicinity of the Weiser Head Start. The computer model used site-specific data, assimilated by DEQ from a variety of sources including local area well logs and various scientific reports (Clark, 1985; DEQ, 1991; DEQ, 1995). The delineated source water assessment area for Weiser Head Start can best be described as a 1,500-foot wide, and 6,000-foot long corridor extending to the east with a slight bend to the southeast. The actual data used by DEQ in determining the source water assessment delineation area is available upon request.

The Weiser Head Start well likely takes its water from the deeper semi-confined lacustrine (lakebed deposit) aquifer below the shallow, unconfined to semi-confined alluvial (river deposit) aquifer. The shallow aquifer has been demonstrated to be a distinct water-bearing unit in terms of water quality, water yield, and the sources of recharge (DEQ, 2000). The lower aquifer contains much lower levels of nitrate, higher levels of iron, and lower levels of arsenic than the shallow aquifer. Water yields from the deeper aquifer are significantly lower than from the shallow aquifer. Ground water in the shallow aquifer is recharged primarily from surface water irrigation, direct precipitation, and canal leakage while the sources of recharge to the deeper aquifer are indeterminate but are very likely much older.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

FIGURE 1. Geographic Location of Weiser Head Start



The dominant land use outside the Weiser Head Start area is irrigated cropland. Land use within the immediate area of the wellhead consists of a school.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both, to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted during December 2000. The first phase involved identifying and documenting potential contaminant sources within the Weiser Head Start Source Water Assessment Area through the use of computer databases and Geographic Information System maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to validate the sources identified in phase one and to add any additional potential sources in the area. This task was undertaken with the assistance of Val Johnson.

There is one potential contaminant site located within the delineated source water area (Table 1, Figure 2), along with Highway 95 and the Union Pacific Railroad line located in the 3-year TOT zone. If an accidental spill occurred from either of these transportation corridors, inorganic contaminants (IOCs), volatile organic contaminants (VOCs), synthetic organic contaminants (SOCs), or microbial contaminants could be added to the aquifer system. The potential contaminant site is a dairy with less than 200 cows located in the 6-year TOT zone. Contaminants of concern are primarily related to arsenic contamination, nitrate contamination, and to the organic priority areas for nitrate and for the SOC pesticide atrazine associated with the irrigated agriculture land use of the area.

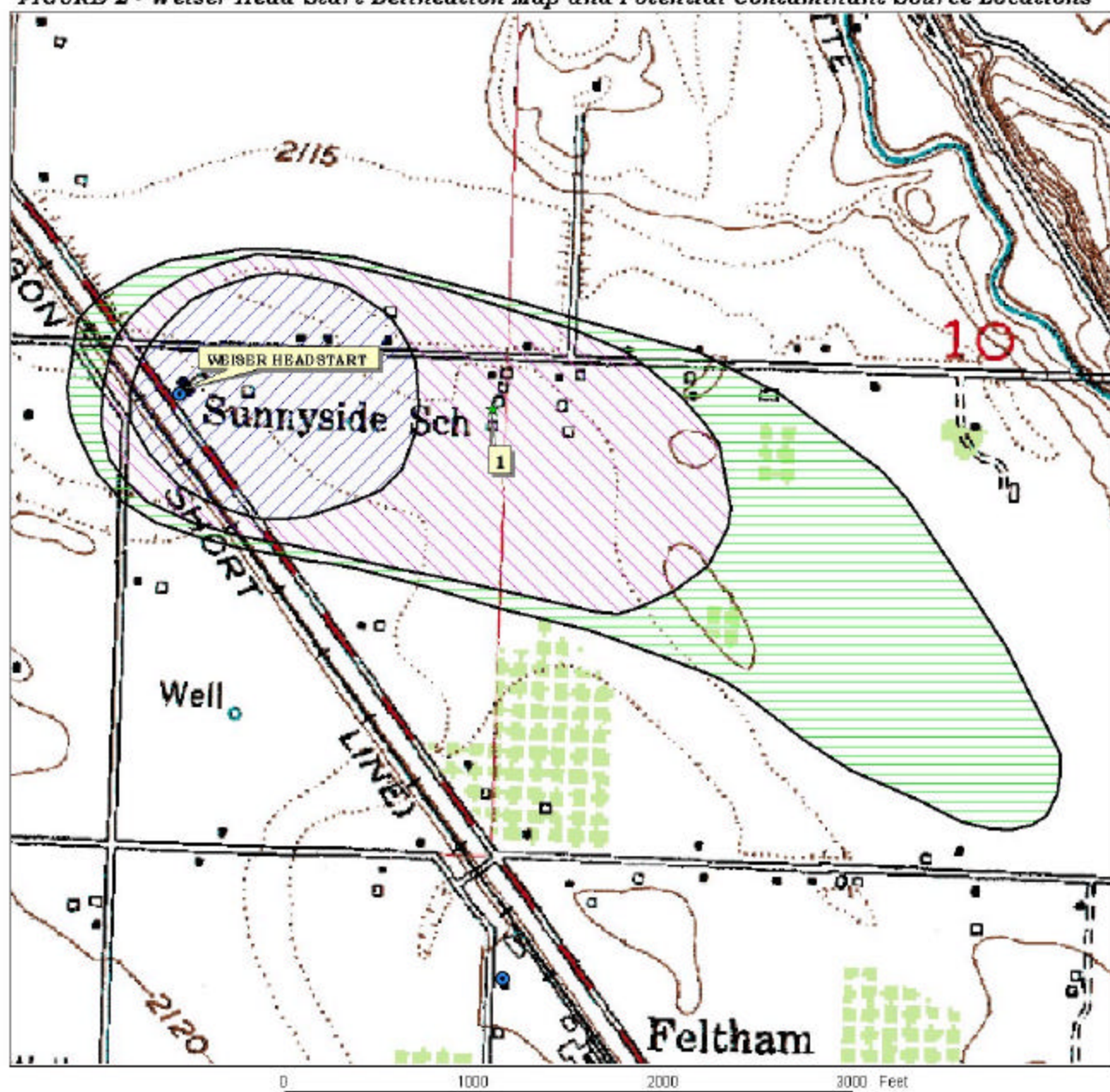
Table 1. Weiser Head Start Well, Potential Contaminant Inventory

SITE #	Source Description	TOT Zone ¹ (years)	Source of Information	Potential Contaminants ²
1	Dairy	3-6	Database Search	IOC, VOC, SOC, Microbial
	Railroad	0-10	Database Search	IOC, VOC, SOC, Microbial
	Highway 95	0-10	Database Search	IOC, VOC, SOC, Microbial

¹ TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

² IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

FIGURE 2 - Weiser Head Start Delineation Map and Potential Contaminant Source Locations



LEGEND

Time of Travel Zones

- 1D (3 yr TOT)
- 2 (6 yr TOT)
- 3 (10 yr TOT)
- Wellhead
- Enhanced Inventory
- CERCLIS Site
- RICRIS Site

- Dairy
- LUST Site
- Closed UST Site
- Open UST Site
- Business Mailing List
- NPDES Site
- Mine
- AST

- Toxic Release Inventory
- SARA Title III Site (EPCRA)
- Recharge Point
- Injection Well
- Group I Site
- Cyanide Site
- Landfill
- Wastewater Land App Site



PWS# 3440010
WEISER HEAD START

Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity was moderate for the well (Table 2). This reflects the nature of the soils being in the poorly drained to moderately-drained class, which inhibits downward movement of contaminants. No well log was available, but nearby wells show that the vadose zone (zone from land surface to the water table) is composed of sand and gravel, which facilitates downward movement of contaminants. The well does not have the requisite 50 feet cumulative low permeability formations which also contributes to the score.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. The Weiser Head Start drinking water system consists of one well that extracts ground water for business uses. The well system construction score was moderate for the well, based on a 1993 sanitary survey and the lack of a well log. At the time of the sanitary survey, the well met the requirements for wellhead and surface seal maintenance. Flood protection standards are being met. Lack of a well log prevented a determination of whether current Idaho Department of Water Resources standards are being met. Important protection aspects of the current standards include casing thickness and whether the casing and annular seal had been extended into a low permeability unit.

The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all Public Water Systems (PWSs) to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Table 1 of the *Recommended Standards for Water Works* (1997) states that 6-inch casing requires a thickness of 0.288 inches.

Based on water chemistry data and local area well logs, the Weiser Head Start well is most likely in the deeper, confined aquifer. The blue clay that forms the barrier between the upper, unconfined sand and gravel, river-deposited aquifer and the deeper, semi-confined lacustrine (lakebed deposit) aquifer is found at 30 to 50 feet below ground surface.

Potential Contaminant Source and Land Use

The well rated high for IOC's (i.e. arsenic, nitrate) and moderate for VOC's (i.e. petroleum products) and SOC's (i.e. pesticides). The well rated low for microbial contaminants. Agricultural chemical sources and irrigated agricultural land use in the delineated source area contributed the largest numbers of points to the contaminant inventory rating. The nearby location of Highway 95 and the Union Pacific Railroad also contributed to the higher scores.

Though there are no current water quality issues facing Weiser Head Start, there is the possibility of arsenic contamination, nitrate contamination, and possible SOC contamination from the pesticide Atrazine and the problems associated with managing this contamination.

Final Susceptibility Rating

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. None of these conditions currently exist. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time-of-travel zone (Zone 1B) and much agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, the well rates high for IOC's, and moderate for VOC's, SOC's, and microbial contaminants.

Table 2. Summary of Weiser Head Start Susceptibility Evaluation

Well #	Susceptibility Scores ¹									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
1	M	H	M	M	L	M	H	M	M	M

¹H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

Though there are no current water quality issues facing Weiser Head Start, the well rates as high susceptibility to IOC's because of the intense agricultural uses nearby. There is the possibility of arsenic contamination, nitrate contamination, and possible SOC contamination from the pesticide atrazine.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully-developed source water protection program will incorporate many strategies. For Weiser Head Start, source water protection activities should focus maintaining the standards for wellhead and sanitary seal protection. Since arsenic contamination may exceed the new drinking water standards, Weiser Head Start should investigate various systems like ion exchange, reverse osmosis, or activated alumina that could be used to treat this problem. Any spills from Highway 95 or the Union Pacific Railroad should be carefully monitored. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented. Most of the designated areas are outside the direct jurisdiction of the Weiser Head Start. Partnerships with state and local agricultural agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the Weiser River Soil Conservation District, and the Natural Resources Conservation Service.

Since the aquifers appear to have alternating layers of clays and sands, a deeper well could be installed to offer better protection from inorganic contaminants for the Weiser Head Start. Any new PWS well should meet the *Recommended Standards for Water Works* (1997) as outlined in IDAPA 37.03.09 and IDAPA 58.01.08.550. Water should be taken from beneath the blue clay layer since the upper aquifer has a higher potential for becoming contaminated.

Assistance

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Boise Regional DEQ Office (208) 373-0550

State DEQ Office (208) 373-0502

Website: <http://www2.state.id.us/deq>

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.

POTENTIAL CONTAMINANT INVENTORY

LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund, is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Clark, W.H., 1985. Water Quality Status Report Lower Weiser River, Washington County, Idaho. Water Quality Series No.53. Idaho Department of Health and Welfare, Division of Environment. In Cooperation with the Weiser River Soil Conservation District.

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Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Natural Resource Conservation Service, 1991. Idaho Snake-Payette Rivers Hydrologic Unit Plan of Work. March 1991.

Attachment A

Weiser Head Start Susceptibility Analysis Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report

Public Water System Name :

WEISER HEAD START

Well# : WEISERHEADSTART

Public Water System Number 3440010

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1. System Construction

SCORE

Drill Date		
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	YES	1993
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0

Total System Construction Score 4

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2

Total Hydrologic Score 4

3. Potential Contaminant / Land Use - ZONE 1A

IOC Score	VOC Score	SOC Score	Microbial Score
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Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2

Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	2	2	2	2
(Score = # Sources X 2) 8 Points Maximum		4	4	4	4
Sources of Class II or III leacheable contaminants or	YES	4	2	0	
4 Points Maximum		4	2	0	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	2	0
Land use Zone 1B Greater Than 50% Irrigated Agricultural Land		4	4	4	4

Total Potential Contaminant Source / Land Use Score - Zone 1B 14 10 10 8

Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	0	0	
Land Use Zone II Greater Than 50% Irrigated Agricultural Land		2	2	2	

Potential Contaminant Source / Land Use Score - Zone II 5 4 4 0

Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	0	0	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	

Total Potential Contaminant Source / Land Use Score - Zone III 3 2 2 0

Cumulative Potential Contaminant / Land Use Score	24	18	18	10
4. Final Susceptibility Source Score	13	12	12	12
5. Final Well Ranking	High	Moderate	Moderate	Moderate